

The large number of spines on the telson and the low number of legs distinguish this form from its allied species and, therefore, are features that need further examination. The latter feature particularly may improve the description of the family Cyzicidae.

A favourably placed naturalist who can undertake frequent trips to Panchgani during the monsoon months may be able to re-discover this rare bivalve Crustacean and throw further light on its taxonomic position. To help in the search the present communication gives a detailed description of the important taxonomic characters.

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# 15. VARIANT BEHAVIOUR OF *CHALYBION BENGALENSE* DAHLB. (HYMENOPTERA, SPHECIDAE)

*Chalybion bengalense* Dahlb. [*Sceliphron violaceum* (Fabr.)] (FAUNA OF BRITISH INDIA, HYMENOPTERA 1: 240) is a common domestic wasp around this part of India. Jayakar & Mangipudi (1964) and the present authors have recently made some contributions to the biology of this species. The females look for convenient natural cavities including derelict nests of other wasps (Jayakar & Spurway 1964b). These they fill with spiders on one of which they have laid an egg. These cells are then sealed with elaborate lids (Jayakar & Spurway 1964a). The North American species of *Chalybion*, which were previously believed (Peckham & Peckham 1905; Rau & Rau 1918) to build their own cells, are now considered as semi-parasites on *Sceliphron* spp., either using disused cells of these species or emptying out the contents

of a cell, recently sealed by the latter, before re-stocking it themselves (Muesebeck *et al.* 1951; Evans 1963). However, we have never seen an individual of *C. bengalense* opening a cell occupied by another species.

*C. bengalense* does not ordinarily seal her cell until she has finished its provisioning. *Sceliphron madraspatanum*, another of our common Sphecids, and the North American *S. caementarium*, on the other hand, put a temporary lid on a cell if they leave it overnight partly provisioned. This lid differs visibly from the 'permanent' lid put on the cell after it has been completely provisioned (Spurway *et al.* 1964; Shafer 1949).

It is, therefore, interesting to record that we have seen at least three individuals of *C. bengalense* putting lids on cells which were partly provisioned. These lids were removed the next morning and provisioning continued. The wasps here described nested in holes in blocks of wood in our house in Bhubaneswar (Unit 5, Type 8, No. 2). Some of these blocks are disused attachments for bathroom fittings and some are designed nest-boxes for wasps (see Jayakar & Spurway 1964b). As we have seen two individuals working simultaneously on the same block we cannot be sure that cells sealed soon after each other contain sibs. However as it is usual for several, or all, the holes in a block to be filled very rapidly, and then for that block to be neglected, sometimes for several months, we consider that these groups usually, but not critically, represent the work of a single female, each of which is referred to by the letters *C. b.* followed by an Arabic numeral. On this criterion we have now records for about 24 individuals of this species since September 1962.

On the morning of 5/9/1963 a hole in a bathroom block was found sealed (*C. b.* 7). The next day, at 08.36, this lid was found to have been removed. There were 2 or 3 spiders in the cell. More spiders were put in during that day but the cell was not sealed again.

On 18/3/64 *C. b.* 18 made a lid on 1. V which she removed in the morning of 19/3, later sealing the cell permanently.

A cell (numbered 1. VIII) in a nest-box was sealed on 14/4/1964 (*C. b.* 21). The lid was noted as being white (see Jayakar & Spurway 1964a) and 'concave' (see Spurway *et al.* 1964). The next morning, at 09.33, the lid had been removed. Later in the day, the cell was permanently sealed after further provisioning. 16/4 was a wet day. On the afternoon of 17/4 another cell in the same box was sealed, the lid being concave and pink (i.e. a thin layer of white on reddish mud). On 18/4, the cell was reopened and re-sealed with a white lid. On 19/4, the same cell was again reopened and re-sealed, the

lid being white. Another cell 1. IV was sealed on 20/4, reopened and re-sealed on 21/4, and again on 22/4. No wasp worked on this block till 2/5 when lids were removed by us, and the cocoons extracted.

On 23/4, a hole in the bathroom block mentioned earlier was sealed (*C. b.* 22). It was reopened and re-sealed on 24/4. Another cell was sealed on 25/4, reopened and re-sealed on 26/4. These dates suggest that these cells may be the work of the individual whose activities were described in the last paragraph, i.e. that *C. b.* 22 and *C. b.* 21 were one and the same wasp.

On 13/5, 1. VIII was again sealed. This nest-box was continually worked on till 24/5, when 1. III was deserted with one spider in it. During this period, the wasp (*C. b.* 23) left a cell incompletely provisioned overnight on 7 occasions on 4 of which she put on a temporary lid but not on the other three. The two methods of leaving an incompletely provisioned cell overnight were intermixed. Two cells were each left unfinished for two consecutive nights. On 3 of these 4 nights, temporary lids were put on, but not on the fourth. It is possible, but improbable, that *C. b.* 23 and *C. b.* 22 were the same individual.

It is necessary to summarise the evidence that the individual who removed a lid was also the individual who constructed it. Firstly, as in *S. madraspatanum*, the lid was removed at the beginning of a day's work. No other work was done between the construction and removal of a temporary lid, and no other cell was worked on until this cell had been again sealed permanently. The ravishing of a completed cell by another individual would not be expected to occur so regularly immediately after closure, and it is even more improbable that the same cell should be the victim on two consecutive days. No spiders or debris were found removed from a reopened cell as we find when wasps prepare a previously used cell for re-use. The temporary lids can sometimes be distinguished from permanent lids by the much thinner layer of white put over the reddish mud. It is curious that any white should be used at all. These temporary lids require more loads than the 1 or 2 out of which individuals of *S. madraspatanum* construct analogous structures. Finally, of the maximum of 5 wasps who have been noted as constructing such lids, 3 constructed more than one of them.

We have, therefore, intraspecific variation in the behaviour of this species, and it is probable that the behaviour of a single individual may also vary in time. As these are the only examples of such behaviour we have seen in this species it is probably rare.

The advantages of such a behaviour pattern are obvious. Parasites of many kinds are common, for example Chrysid wasps who lay their own eggs in the cell, and so are labour parasites such as ants and Salticid spiders who remove spiders stocked in the cells. It is surprising that such behaviour has not been evolved in wasps other than *Sceliphron*.

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#### 16. *IXODES KERRI* RAO, 1954 : A SYNONYM OF *IXODES PETAURISTAE* WARBURTON, 1933 (ACARINA : IXODIDAE)

(With one text-figure)

In 1955 the author had the privilege of describing the first member of the genus *Ixodes* ever collected in India south of the Himalayas. It was described as *Ixodes kerri*, in the belief that it was a new species after consultation with taxonomists specializing in ticks. However, later when more specimens of the tick were available in the Sagar-Sorab area of Mysore State it was realized that it could be synonymous with *Ixodes petauristae* which had been described on the basis of a single female from Ceylon by Warburton (1933). Warburton's specimen was also taken from a flying squirrel.